

Yarmouk University

Faculty of Economic and Administrative Science

Dep. Of Banking & Finance

" Calendar Anomalies: The Case of the Gulf Cooperation Council Stock Exchanges"

"إنحرافات التقويم: حالة أسواق الأسهم في مجلس التعاون الخليجي"

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Program: Banking & Financial Science

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Dedication

I dedicate this work to…

Those who recognized that education begins at home and they took responsibility to assure that their children are well educated… who were the real foundation of all worthwhile success… My Parents

Those who pick me up whenever I fall… who taught me to create harmony among the elements within me… My beloved Brothers and charming Sister

Those who have always pointed the way and let me make my own choices, my own mistakes, instead of just giving the answers, forming the best source of motivation and confidence… My Teachers

The one who was the light of guidance through the ocean of this work, were I was the ship but she was the compass… My Supervisor Dr . DimaWaleed Al-Rbadi

Those who were the spices of a great 6 years of university life… who colored my days with joy and laughter… My Colleges and Friends

This work is a two years journey… I thankfully dedicate it to everybody who has been a part and a living stone in the roads of this journey

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Marsel Sulaiman Al-Khader

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Abstract

This study examines the calendar anomalies in Gulf Cooperation Council (GCC) stock exchanges over the period (2002-2012). In specific, we investigate the day of the week, the month of the year, and the turn of the month effects. To accomplish these objectives, a various econometric techniques are used to test the study empirical models of dummy variables. The estimation results of OLS and GARCH shows that, the Day of the Week Effect (Monday Effect) exist only in Bahrain and Kuwait stock exchanges, with no Monday effect exist in other stock exchanges. Moreover, the results show no statistically significant January and Turn of the month effect exist in any of GCC stock exchanges. Based on these findings, the study recommend Bahraini and Kuwaiti investors to buy their stocks on Monday.

Chapter One

Introduction

1.1 Introduction

1.2 Problem of the study

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Chapter One

Introduction

1.1 Introduction:

The efficient market hypothesis (EMH) has been found by Eguene Fama (1970s) in the global financial markets. It states that stock prices reflect all relevant information. Thus no investor can predict the movements of the stock price and consequently investors could not achieve abnormal returns using any investment strategy. The EMH is based on the random walk theory which indicates that stock prices move randomly in an unexpected manner. Fama, (1970) determined three levels (forms) of market efficiency: weak form, semi-strong form, and strong form.

In the weak form, the hypothesis states that stock prices reflect all past (historical) information including previous financial statement and trading data. In the semi-strong form, prices reflect all publically available information as well as historical information and prices instantly change to reflect new public information. Dividends announcements are good example of the publically available information. Finally under the strong form of efficiency, prices reflect all past, publically, available, and private (insider) information.

According to the efficient market hypothesis, money and capital markets are highly efficient in digesting the new information that affects security prices. In other words, securities prices must reflect all relevant information quickly and accurately.

This hypothesis was acceptable and applicable till some effects were appeared and made some problems that caused some challenges to it called anomalies (Kuhn, 1970).

The anomaly is a price and/or a rate of return distortion in a financial market that seems to contradict the efficient market hypothesis (anomalies). Thus, investors can use these anomalies to formulate investment strategies and achieve abnormal returns. The existence of such anomalies indicates that prices are predictable and deterministic. In other words, price anomalies contradict the random walk theory and the EMH (Kuhn, 1970).

Calendar anomalies are well-known and important ones. Day of the week effect, month of the year effect, and turn of the month effect are all examples of calendar anomalies. This thesis focus on these anomalies. Indeed, we investigate calendar anomalies in GCC stock exchanges over the period 2002 to 2012.

1.2 Problem of the study:

The GCC stock exchange market includes 6 of Arab countries; Kingdom of Saudi Arabia, United Arab Of Emirates, Kuwait, Bahrain, Qatar, and Oman. All these countries are developing. These exchanges has a lot of characteristics related to their nature, such as asymmetric information, transparency, the market reaction to different events, and the extent they are affected by the financial crises.

This study will examine a partial case of challenges that may affect the efficiency of the market (Calendar Anomalies), taking into account these features of developing exchanges that mentioned above.

The problem of the study is to investigate whether the day of the week effect, the month of the year effect, and the turn of the month effect exist in the GCC stock exchanges over the period from 2002 to 2012.

1.3 Objectives of the study:

The aim of this study is to investigate the calendar anomalies in the (Gulf Cooperation Council for the Arab states of the Gulf) GCC stock exchanges. Specifically, we investigate the day of the week effect, the January effect, and the turn of the month effect. It also aims of the market efficiency at the weak level.

1.4 Importance of the study:

Investigating calendar anomalies is a very important topic for both academians and practitioners. This study will fill the gap of the lack of previous studies in this field in the GCC stock exchanges over the study period in order to make benefit for the researchers that will help them to understand the characteristics of these developing exchanges. Indeed, the existence of such anomalies indicates that markets are inefficient at the week level. This will break down the grip of challenges of the efficient market hypothesis which is the focus of research for many academians. The existence of calendar anomalies would enable practitioners and investors to predict stock returns, formulate investment strategies accordingly and achieve abnormal returns based on our results.

1.5 Hypotheses of the study:

The study has four main hypotheses:

- H_1: There is a statistically significant day of the week effect in the GCC stock exchanges.
- H_2: There is a statistically significant January effect in the GCC stock exchanges.
- H_3: There is a statistically significant turn of the month effect in the GCC stock exchanges.

1.6 Organization of the study:

Chapter one presents an introduction of the study. Chapter two displays the theoretical framework. In chapter three we review the literature associated with calendar anomalies. Chapter four discusses the methodology of the research and the data used. Chapter five shows the results and analysis. Chapter six summarizes the results and displays the recommendations.

Chapter Two

Theoretical Framework

2.1 Introduction

2.2 Efficient Market Hypothesis

2.3 Evidences Supporting the Efficient Market Hypothesis

2.4 Evidences Against the Efficient Market Hypothesis

2.5 Calendar Anomalies

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Chapter Two

Theoretical Framework

2.1 Introduction:

The Efficient Market Hypothesis (EMH) is an important and central topic in financial market analysis. This theory has become widely accepted since late 1950's and early 1960's under the rubric of the "Theory of random walks" in the finance literature and the "rational expectations theory" (Borker, 1967) in the mainstream economic literature (Jensen, 1978), it was developed in 1970 by economist Eguene Fama. The (EMH) theory states that stock prices fully reflect all past, publicly available, and insider information in the market (Fama, 1970).

This chapter provides an overview of the market efficiency hypothesis, its history, definition, and the three forms of it. Then, we discuss evidences that support the (EMH) and those that are against it. Moreover, we talk about the calendar anomalies, mainly January effect, day of the week, and turn of the month. And finally we will state an overview of the GCC stock exchanges.

2.2 Efficient market hypothesis:

2.2.1 Definition of the Efficient Market Hypothesis

Market efficiency is an investment theory which states that the prices of the stocks do fully reflect all related information in the market. According to this theory, the new information will immediately be reflected in the prices of all securities. So, no investor can gain abnormal returns and no investor can predict the new prices previously (Sharp and Alexander, 1990). Therefore, it is impossible to beat the market, which means that stocks are always traded at their fair value (at equilibrium) (Buffet, 2009). In stock exchanges, it is impossible for the investor to purchase undervalued stocks or sell overvalued stocks because the information must have already expressed in stock prices (Lo,2007). In this case, the only way for investors to obtain higher return is to invest in riskier investments.

2.2.2 Major Forms of the Efficient Market Hypothesis

The efficient market hypothesis can be considered as the cornerstone of the modern finance.

In 1970, the economist Eguene Fama set the hypothesis of the efficient market. He plotted the hypothesis in three major forms. Under these forms, the different types of information will be reflected in the security.

2.2.2.1 The Weak Form of the Efficient Market Hypothesis

In this form, all past prices of securities are reflected in today's stock price. It implies that all historical information is already incorporated into the current price. The prices always reflect the available information, so no profit can be made from trading information (Lo and MacKinley 1999). Thus, investors can't use past information to predict stock prices.

The fundamental analysis[(1)] in this form can be used to identify stocks that are undervalued and overvalued. The technical analysis[(2)] can't be used to predict and beat the market (Buffet, 2009)

2.2.2.2 The Semi Strong Form of the Efficient Market Hypothesis

This form implies that all public (past and instantly available) information is incorporated into stock's current price. This includes the information in the stock prices, information in firm's accounting reports, the announced information that has linkage with the economy, and any

(1): A method of evaluating securities that entails attempting related economic, financial, and other qualitative and quantitative analysis

(2): A method of evaluating by analyzing statistics generated by market activity, such as past prices and volume.

dividend publicly available information (Haugen, 2001). The implication of this form is that whenever information is released to the public, stock price will respond only if the information is different from what had been expected. Therefore only insider (private) information can benefit investors who are seeking to earn abnormal return on investments. Neither fundamental nor technical analysis can be used to achieve superior gains (Buffet, 2009).

2.2.2.3The Strong Form of the Efficient Market Hypothesis

It is the strongest form of the market efficiency. It states that all the information in the market whether it is public or private is reflected in stock prices (Fama, 1970). The price quickly adjust to reflect the insider information so who has the inside information can't gain with it. Even insider information could not give investors the advantage to beat the market (Grossman, 1976), (Malkiel and Finstenberg 1978). In other word, the professional investors has a zero market value (Haugen, 2001) This form doesn't exist in real exchanges because of the hidden and unsystematic information. For example, the GCC stock exchanges are not perfect, hence the asymmetry information is expected to exist and affect investors decisions.

2.3 Evidences Supporting the Efficient Market Hypothesis

Some researchers find evidences supporting the efficient market hypothesis, (Stanlry, 2011) we mention some of them:

2.3.1 Performance of Investment Analysis and Mutual Funds

One common test that has been performed is to take buy and sell recommendations from a group of advisers or mutual funds and compare the performance of the resulting selection of stocks with the market as a whole (Jensen, 1968).

According to the efficient market hypothesis, the investors can't gain abnormally high returns greater than the equilibrium return. The mutual funds do so (Malkiel,1995). In other words, if the performance of mutual fund having done well in the past, the investment or mutual funds will not necessarily perform well in the future (Ippolito, 1989).

2.3.2 Random-Walk Theory

Random-walk theory implies that the stock price fluctuation is independent overtime and may be described by a random process (Porker, 1967).

This financial theory describes the movements of variable that can't be predicted in future. In specific, it can be determined whether the prices

are going to fall or rise. So that the changes in the stock prices in the future are unpredictable (Coonter, 1964), (Lo and MacKinley, 1999).

The random walk theory uses two types of tests. The first one tests to examine the stock market records if the change in prices of stocks are attributable to the past changes. The second one tests whether the hidden (insider) or publically available information can be used to predict the changes in stock prices (Kendall and Bradford, 1953).

2.3.3 Technical Analysis

Technical analysis a methodology or technique used to predict stock prices. Technical analysis examines past stock price data and search for patterns such as trends and regular cycles (Sullivan et at, 1998). Rules for when to buy and sell stocks are then established on the basis of the patterns that emerge. The efficient market hypothesis suggests that technical analysis is a waste of time. The simplest way to understand why is to use the random-walk result derived from the efficient market hypothesis that holds that past stock price data cannot help predict changes (Alexander, 1961). There are two types of tests that bear directly on the value of technical analysis. The first uses the empirical analysis described earlier to evaluate the performance of any financial analyst, technical or otherwise. The results are exactly what the efficient market hypothesis predicts. This analysis considers a good

evidence of prediction, but it doesn't mean that this prediction can be applied on the market in the future . The second type of test takes the rules developed in technical analysis for when buying and selling stocks and applies them to new data. The profit achieved by trading evaluates the level of performance (Alexander, 1961), and (Allen and Karjalainem, 1999).

2.4 Evidences Against the Efficient Market Hypothesis

In recent years, the theory has begun to show a few challenges, referred to as anomalies, and the empirical evidence indicates that the efficient market hypothesis may not always be generally applicable.

2.4.1 Small Firm Effect

The studies show that the small firms earn abnormally higher returns over long periods of time than large firms (Reinganum, 1983).

In spite of the fact that, this anomaly appears to be unimportant in the recent years, it still beat the efficient market hypothesis. Many studies try to explain this effect and they suggest that it may happen because of rebalancing of portfolios by investors, tax issues, low liquidity of stocks for small firms, the high cost of evaluating the information, or unsuitable measurement of the risk for small firms (Roll, 1989), (Ritter, 1988).

2.4.2 Excessive Volatility

This effect entails that stock prices fluctuate sometimes by a much greater amount than what we predict of its basic value in stock markets (Shiller, 1981), and (French and Roll, 1986). This unpredictable fluctuations may be explained by the market overreaction that leads to excessive volatility.

2.4.3 Mean Reversion

This assumption assumes that stocks with high or low prices are temporary. They will tend to move to the average price overtime (Poterba and Summers, 1988).

Some studies find that this effect exists, and thus we can predict stock prices in the future. In spite of this, other studies find that this effect is not strong in data. Thus, this effect is considered controversial (Jegadesh and Titman, 1993).

2.5 Calendar Anomalies

Calendar effect is the extent to which holding stock at a particular time can help or harm returns. Some analysts believe that stocks perform better or worse on given days, months, or years (Kamster et at,2003). The calendar effect describes the capability of stocks to perform differently at different periods of time. Some of these patterns are found

to exist in volume and the other in volatility, as well as in returns. The following section displays these patterns that may affects the stock prices depends on different time in a year.

2.5.1 Day of the Week Effect

The day of the week (DOW) is one of the most widely documented seasonal anomalies according to which stock returns are significantly higher on some days of the week than other days (Lakonishok and Smidt, 1988; Aggarwal and Tandon 1994).

The day of the week indicates that the returns are lower in the first days of trading and higher in the last days of trading, comparing with other days of the week (Barone, 1989). The reason behind the presence of this effect is attributable to many factors. Some of these factors is the delay between trading and settlement in stocks, spill-over effect from large markets, concentration of certain investment decisions, timing of corporate release after Thursday's close, low institutional and individual trading on Sundays, risk-return tradeoff, delayed savings for two weekends a year, speculative short sales, politics, and macroeconomics and transaction cost (Charles, 2007).

The existence of the day of the week effect causing the conflicts with the efficient market hypothesis as it implies that investors can make a strategy for trading securities to benefit from these seasonal regularities.

2.5.2 January Effect

January effect (the month of the year effect). It is the capital market anomaly in which equity returns are significantly higher in January than the other months of the year (Gu,2003; Schwert, 2003; Rozeff and Kinny,1976). Stock prices tend to have an abnormal price rise from December to January that is predictable and inconsistent with random-walk behavior (Keim, 1986). This effect decreased in recent years for shares of large companies but still occurs for shares of small companies. Some financial economists argue that the existence January effect is attributable to tax issues. Investors sell stocks before the end of the year in December, because they can then take capital losses on their tax return and reduce their tax liability. Then when the new year starts in January, they can repurchase the stocks, and achieve abnormally high returns. (Huberman and Kandel, 1990).

2.5.3 Turn of the Month Effect

It is a temporary increase in the prices of securities during the last few days (usually during the last four days) and first few days (usually the first 3 days) of each month (Arial, 1987). According to the turn of the month (TOM) effect, the returns are significantly positive at the turn of the month (Odgem,1990; Cadsby and Ranter, 1992) and the returns are positive in the first half of the month (Lakonishkok and Levi, 1982).

The turn of the month effect can be due to distributions from pension funds and other retirement accounts, thus the pensioner immediately reinvest in the stock market. The reason of the turn of the month effect is ascribe to the timing of monthly cash flows received by pension funds and reinvested in the stock market (Odgem, 1990). The end of the month is a natural point for portfolio trading, so it permits to rebalancing between retail investors.

2.6 An Overview of the GCC Stock Exchanges

In this section, we present important information for each stock exchange from the GCC stock market. The following section explains each stock separately. It displays some information such as the date of establishment, the trading system, the number of the companies listed, the number of sectors, and the market capitalization of each stock exchange. This information makes an overview of each stock exchange individually in order to compare each one with others, and gives a general idea of these stock exchanges overall.

The first Bahraini Public Shareholding Company was established in 1957. Since then, more local public shareholding companies began to operate, reaching their peak in the beginning of the 1980's. During this period, shares of public shareholding companies were being actively traded in a non-official market called "Al Jowhara Market". The Bahraini

Government established Bahrain Stock Exchange in 1987. The Exchange officially commenced operations in June 1989 with 29 Bahraini shareholding companies listed. In 1999, Bahrain Bourse (BHB) implemented the Automated Trading System (ATS) to carry out all the bourse's transactions electronically, replacing the old manual system. The Bahraini Borse consists of 44 company in the sectors of commercial bank, investment, services, insurance, industrial, hotel and tourism, preferred share, and non-Bahraini companies. The Bahraini Dinar and the U.S Dollar are the currencies of the trading.

(http:www.bahrainbourse.net).

The Securities & Commodities Authority (SCA) has been founded in 2000. As a matter of fact, both the Abu Dhabi Securities Exchange ADX & Dubai Financial Market DFM are the actually bourses eligible for trading transactions of the listed companies' shares. Therefore, the SCA has successfully managed to link both markets via electronic installation of the live-market-watch screens for the Emirates Securities Market ESM. The companies trades in the Dirham currency. There are 60 companies listed in Dubai stock exchange, and 66 companies listed in Abu Dhabi stock exchange in the sectors of banks, insurance, real estate, energy, telecommunications, financial investment, transportation,

industrial, consumer staples, and services. (http:www.esm.sca.ae), (http:www.adx.ae), (http:www.dfm.ae).

Kuwaiti investors were introduced to trading in stocks with the creation of the National Bank of Kuwait in 1952 as the first Kuwaiti shareholding company. in August 1983 with the issuance of an Amiri Decree establishing Kuwait Stock Exchange. Kuwait has always been a leader amongst Arab nations in respect of stock market trading. In November 1995, KSE implemented its first electronic trading system. Online trading started in November 2003. Now they are equipped with their own order management systems and many are building much more sophisticated back offices. Accordingly, both the exchange and the market participants are preparing for "Phase 2" of the new trading system, which will allow KSE to introduce a wide range of new products and services, potentially including futures and options in the international form, market-makers for appropriate products, fixed income instruments including sukuks, new indices. The Kuwaiti stock exchange include 208 companies in oil and gas, basic materials, industrials, consumer goods, health care, consumer services, telecommunications, utilities, banks, insurance, real estate, financial services, investment instruments, and technology sector. (http:www.kse.com.ku).

The Muscat Securities Market (MSM) was established by the Royal Decree issued on 21 June 1988 to regulate and control the Omani securities market and to participate, effectively, with other organizations for setting up the infrastructure of the Sultanate's financial sector. As a continuing process in the development of the securities market, the MSM has developed its regulations to provide information and financial data relating to the performance of the Market and all listed companies directly to investors through a highly advanced electronic trading system. The financial sector, mutual funds, industrial sector, bonds, and services sector include 115 companies listed in the (MSM). The trading is accomplished by the "Omani Real". (http:www.msm.gov.om).

The Qatar exchange Established in 1995, the Doha Securities Market (DSM) officially started operations in 1997. Since then the exchange has grown to become one of the leading stock markets in the GCC region. It consists of 42 companies in banks and financial services, consumer goods and services, industrial, insurance, real estate, telecoms, and transportation. The "Qatari Real" is the currency used in the trading. (http:www.qe.com.qa).

The Saudi market (Tadawul) remained informal, until the early 1980’s when the government embarked on forming a regulated market for trading together with the required systems. In 1984, a Ministerial

Committee composed of the Ministry of Finance and National Economy, Ministry of Commerce and Saudi Arabian Monetary Agency (SAMA) was formed to regulate and develop the market. SAMA was the government body charged with regulating and monitoring market activities until the Capital Market Authority (CMA) was established in July 2003 under the Capital Market Law (CML) . The CMA is the sole regulator and supervisor of the capital market, it issues the required rules and regulations to protect investors and ensure fairness and efficiency in the market. Now "Tadawul" consist of 160 companies accomplish their trading by the "Saudi Real" currency. "Tadawul" includes the sectors of banks and financial statement, petrochemical industrial, cement, retail, energy and utilities, agriculture and food industries, telecommunication and information technology, insurance, multi-investment, industrial investment, building and construction, real estate development, transportation, media and publishing, and hotel and tourism. (http:www.tadawul.com.sa)

Table (2.1) shows the 6 stock exchanges at the GCC with the market capitalization and a summary of the number of sectors and listed firms according to 2012 statistics.

Table (2.1) reports that Kuwaiti Stock Exchange is the largest stock exchange in items of the number of companies listed in the GCC stock

market. Saudi Stock exchange (Tadawul) is the largest stock exchange in items of its sectors. The table shows a small number of sectors and low value of market capitalization in the Omani exchange (Muscat Stock Exchange), while the company listed in this stock exchange is relatively high. The Qatari market (Doha Stock Exchange) has the fewest number of companies listed.

Table 2.1: The GCC Stock Exchanges

Stock Exchange	Number of Sectors	Market Capitalization In Local Currency	Number of Listed Firms
The Kuwait stock exchange	13	24,370,912,759	208
The Muscat stock exchange	3	4,954,803,716	115
Saudi Arabia stock exchange	15	1,467,078,913,270	160
The Abu Dhabi stock exchange	9	253,947,498,154	66
Bahrain stock exchange	7	18,098,975,275	44
Dubai stock exchange	9	216,264,114,434	60
Doha stock exchange	7	287,330,671,798	42

*The information used from the websites of each stock exchange according to the 2012 statistics.

*The table is prepaid by the researcher.

Chapter Three

Literature Review

3.1 Introduction

3.2 Literature Review in Emerging Exchanges

3.3 Literature Review in Developed Exchanges

3.4 Literature Review in Emerging and Developed Exchanges

3.5 Summary

Chapter Three

Literature Review

3.1 Introduction

As we mentioned before, the aim of this study is to examine if the calendar anomalies exist in the GCC stock exchanges along the period from 2002 to 2012. To accomplish this goal, we must review some of studies that may attribute to the subject of the study

The following chapter displays the previous studies that talk about the calendar anomalies. We focus on the studies of January effect, Day of the Week effect, Turn of the Month effect, and the market efficiency of stock exchanges. We split the reviewed studies according to the markets mainly developed and emerging exchanges.

3.2 Literature Review in Emerging Exchanges

Aggawral (1989): This study examines seasoned and daily patterns in equity returns and examines the efficiency and functioning of the capital markets. The study is applied in four emerging markets; Hong Kong, Singapore, Malaysia, and Philippines from September 1st, 1976 to June 30th, 1988. The results show that there is a robust day of the week effect.

There is a January effect for all markets except the Philippines. Moreover, there is a "Tuesday effect" in these markets. This effect may be related to the difference of time (13 hours) between New York and the Markets examined in the study.

McGuiness (2006): This study analyzes the monthly returns for a liquid pool of small-cap stocks. It used the small cap stocks in Hong Kong from January 2000 to June 2005. The methodology measured returns between the close of trading on the penultimate day of business in a calendar month and the subsequent close five business days later. A strong and persistent 'turn-of-the-month' effect is apparent. Further, analysis also points to differential day of the week effects with Tuesday and Friday returns in particular at noticeably lower levels during the final week of a month as compared to earlier weeks.

Al-Khazali (2008): The purpose of this study is to examine the impact of thin trading on the day-of-the-week effect in the emerging equity markets of the United Arab Emirates (UAE). This study applies a stochastic dominance approach to detect the day-of-the-week effect. The reason for utilizing this approach is that the parametric tests are not strictly appropriate for assets with non-normally distributed returns. The findings indicate that there is a day-of-the-week effect in published daily prices, while daily effect vanishes when data are corrected to remove any

measurement bias arising from thin trading. The stochastic dominance results show that the day-of-the-week effect in the UAE equity markets is not present when we correct raw data for thin and infrequent trading.

Ullah S, Ullah O and Usman (2010): The objective of this study is to assess the day of the week effect in Pakistani Stock Market. The study chooses data from the top 25 companies which includes the daily closing prices of all week days. The daily closing price used for calculating daily returns. the methodology in this study applies the ANOVA regression analysis and the least Significant Different test (LSD). The findings of the study indicate that no significant day of the week effect that may influence stock returns.

Ulussever, Guranyumusak, and Kar (2011): This study investigates the day of the week effect in the stock exchange market of Saudi Arabia. The sample includes all the companies listed in the stock exchange market which called "Tadawul" from January 2001 to December 2009. The paper uses a non-linear GARCH model. The results confirm the existence of the day of the week effect in Tadawul.

Harper and Jin (2011): This study tries to determine whether the Indian stock market is efficient at the week level through testing if the stock prices follow a random walk. The methodology used is based on testing the autocorrelations that make assumptions about the normality of data

and tests which examine randomness. The study uses daily price data from July 1997 to December 2011. Findings indicate that the Indian stock market is not efficient in the weak form during the testing period. This implies that it is possible to get abnormal return because the Indian stock prices do not reflect all the information of the past .

Alrabadi and Qudah (2012): The aim of the study is to examine the calendar anomalies in Amman Stock Exchange (ASE) from 2002 to 2011. The study used the monthly and daily returns of the free float market index, based on regression estimated by using OLS and GARCH models. The study found a persistent day of the week effect and January effect over the time period and most of returns happened on the turn of the month.

Al Ashikh (2012): The aim of this paper is twofold: first, it investigates the existence of the random walk hypothesis (RWH) by testing the weak-form of efficiency in the Saudi Stock Exchange (SSE), using a set of highly regarded parametric and nonparametric linear serial dependence tests. Second, it investigates the existence of the day-of-the-week effects. To investigate the effectiveness of all linear statistical models in examining EMH, a sample has been chosen from the Saudi Stock Exchange. The constituents of the sample include Tadawul All-Shares Index (TASI) ,Banks and Finance Services Index (BFSI) , Saudi Arabia

Basic Industries (SABIC), Saudi Telecommunication Company (STC), Savola Group (SAVOLA) from 1999-2010. The methodology depends on the standard Ordinary Least Square (OLS) and the GARCH model. The results obtained from the linear serial dependence tests indicate that linear dependence is exists in the Saudi market returns and thus, it is in efficient at the week level. Additionally, there is a significant day of the week effect in the Saudi stock market.

Ngugen C, Chang and Ngugen T (2012): The study examines if the Taiwan stock market is efficient at the week level. It modified and estimated Dockery and Kavussanos' multivariate model using a set of Taiwanese panel data. It uses randomly 540 sample stock from January and February 2008, May and June 2009, November and December 2010. Although the Taiwan stock market is regulated, liquid and linked with the world, the results reach that the market is not informally efficient. It may be attributable to the lack of broadness and depth of the stock markets of developing and emerging economies, in general, and the Taiwan economy in particular.

Patel, Radadia, and Dahwan (2012): The aim of this study is to examine the day of the week effect in Asian stock markets including India, Hong Kong, Japan, and China from 1st January 2000 to 31st March 2011. The sample is divided into 3 sub period, and then the study uses

the logarithm transformed stock prices. The results can be summarized as: the Bombay stock exchange (India) has the maximum average positive returns on all trading days. The Shanghai stock exchange (China) has the highest returns in Thursday and Wednesday. Hong Kong stock exchange (Hong Kong) has the maximum average return on Friday and high standard deviation in Monday. Monday has the maximum volatility day comparing to other trading days in the Asian market. The general results says that there is no evidence to talk about of the day of the week effect in the Asian stock markets.

Ahsan and Sarker (2013): This study investigates the presence of January effect in Dahka stock exchange (DSE) in Bangladesh. It uses a sample from January 1987 to November 2012. The methodology applies regression analysis. The study finds another anomaly which is the June anomaly, but it doesn't find the January effect in Dahka stock exchange.

Rafique and Shah (2012): This paper examines the turn of the year effect and the impacts of this effect on the stock prices of Pakistani stock exchanges. It applies regression analysis with dummy variables to the stocks return data over the period March 1997 to March 2001. The results find a significant returns in May, which indicates the presence of May effect. In addition, negative returns in January which means there is an absence of the existence of January effect.

3.3 Literature Review in Developed Exchanges

Barone (1989): The aim of this study is to test the existence of information inefficiencies in stock exchanges by analyzing the impact of particular dates and calendars on stock price changes. The index of Milan Stock Exchange was used from January 2nd, 1975 to August 22nd, 1989. The methodology represents testing the systematic anomalies which include weekend and public holidays, the end of the calendar and stock exchange months, and the end of the year. The results indicate to evidence of anomalous changes, but not stable over time.

Dahlquist and Sellin (1994): This study examines the January effect in the Swedish stock market and tests two potential explanations for the seasonalities: the tax-loss-selling hypothesis and the omitted-risk-factor hypothesis. It uses the monthly index of Swedish stock returns from January 1919 to December 1989, and conducts the analysis within the framework of Generalized Method of Moment (GMM). The results of the study reject the tax-loss-selling hypothesis. Findings indicate higher returns in January and July. Moreover, June and December return variances are small relative to other months. And finally there is an interaction between variance and mean seasonal effects.

Alexkis and Xanthakis (1995): The purpose of the study is to examine the day of the week effects in Greek Stock Market from January 1985 to

February 1994. The methodology here depends on dividing the market into two sub periods since 1988, in which it operates under backward statutory conditions. All the significant changes have been introduced affecting all market players. The results found a positive return in Mondays and negative returns in Tuesdays.

Charles (2007): This study investigates empirically the impact of the day of the week effect on volatility. The study used 5205 observations from five international stock markets; France, Germany, U.S, U.K, Japan over time period July 7^{th}, 1987 to July 27^{th}, 2007. The methodology is based on using daily returns as a natural logarithmic first difference of the daily closing price and by using GARCH family models. The results indicate that the day of the week effect detected on volatility do not seem to improve the volatility forecast. Indeed, the sign of the statistics is negative, implying that the day-of-the-week effects observed on volatility do not provide a better volatility forecast.

Baker, AbdulRahman and Saddi (2007): This study tried to test the day of the week effect on both mean and volatility. The sample is Toronto Stock Exchange from January 3^{rd}, 1977 to March 31^{st}, 2002. The study computes daily returns as a nature logarithm first differences of the sample by using several specification for the error distribution like GARCH, student t, General Error Distribution (GED), and Double

Exponential Distribution (DED). The study found strong presence of the day of the week effect, and it is sensitive to error distribution.

Floros (2008): The aim of this study is to investigate the monthly and trading month effects in Athens Stock Exchange (ASE). The data used divided into 3 time periods; November 26th, 1996 to July 12th, 2002 for (ASE). September 23rd, 1997 to August 30th, 2001 for FTSE/ASE-20. December 8th, 1999 to August 30th, 2001 for FTSE/AEE Mid 40. The study used daily closing price of the general ASE index, and examine the calendar effects in Greek Stock Market by using Ordinary Least Squares (OLS) model. The results told that there is no January effect in the period, in other word, daily returns are not higher in January than in any other month.

Hepsen and Ali (2012): The study inspects the existence of the calendar anomalies (January effect, day of the week effect, turn of the month effect), and investigates the anomalous behavior in real estate investment trusts. It is applied on Istanbul stock exchange (ISE) over the period January 4th 2000 to December 31st 2010. The study uses the ordinary least square (OLS) with dummy variables. The findings indicate the presence of January effect and turn of the month effect. Further it, finds lower returns on Monday comparing to the other days of the week.

3.4 Literature Review in Emerging and Developed Exchanges

Asbell and Bacon (2010): This study tests the semi-strong EMH through analyzing the effect of insider trading on the risk adjusted rate of return of the firms stock prices. Moreover, it investigates the market speed to react to this type of information. This decision whether the market is efficient depends on assessing the investor's ability to earn an abnormal return by acting on insider purchases. The methodology used in this study is the standard event study. The study sample includes 25 companies. Insiders purchases were randomly selected on November 26, 2008. This random sample is selected from the NYSE or NASDAQ. The Results indicate that there is a slight positive reaction prior to the announcement date, and a significant positive reaction after the announcement. The study fails to support the Fama's theory of efficient market at the semi strong form level. The announcement of insider purchases is viewed as a mixed signal. For example there is no significant insider trading before the purchase date is found, but a significant upward trend after the purchase date is reported.

Patel (2012): The aim of study is to compare the performance of small firms with the performance of large firms. The sample used is the developed and emerging stock markets from 1969 to 1986. The study

used T-test to examine the differences in returns between stock indices, using (ANOVA), median test statistics, and t-test as U test to examine the differences in size premium. The results indicate that the stock markets have no longer a size effect or reverse effect because small firms didn't generate significantly different returns than larger firms, and size premium is not sensitive to market condition and not significantly higher in January.

3.5 Summary

In this chapter, we displayed literature review that is attributable to the efficient market hypothesis, random walk theory, and the calendar anomalies that challenged the efficient market hypothesis. The results of the previous studies different from one stock exchange to other. Some of the studies find the anomalies while the other don't. Most of studies find the calendar in both developed and emerging exchanges. Thus, it indicates that the markets are inefficient. These results may be attributable to the features of each stock exchange such as low or high liquidity, available or unavailable information, the market size, and the volume of trading.

Chapter Four

Data and Methodology

4.1 Introduction

4.2 Data

4.3 Research Methodology

Chapter Four

Data and Methodology

4.1 Introduction

The current study aims to find if calendar anomalies exist in the GCC stock exchanges over the period 2002-2012. To accomplish this objective, we must choose robust methods to make the right analysis and obtain valid results. This chapter presents the data set that we will apply in the study and the basic methodology which mainly depends on regression analysis with dummy variables.

4.2 Data

The study uses the daily market index for each exchange of the GCC stock exchanges to examine the Sunday Effect (the Day of the Week Effect) and the Turn of the Month Effect. It also uses the monthly index for each exchange of the GCC stock exchanges to examine the January Effect (the Month of the Year Effect).

The idea for selecting the market index is that the index gives a general average for all the companies listed in the stock exchange. So, the market index presents the general index of trading overall the exchanges.

The daily data extends over the period from Dec, 31 2007 to Dec 31 2012. The monthly data ranges from May, 31 2002 to Dec, 31 2012.

The resulting data consist of 1305 daily observations and 127 monthly observations for each stock exchange. Long periods are used in order to enrich our results with more validity.

4.3 Research methodology

Our methodology is mainly based on regression analysis with dummy variables under the classical assumption:

- The regression model is linear in the coefficient, is correctly specified, and has an additive error term.
- The error term has a zero population mean.
- All explanatory variables are un correlated with the error term.
- Observations of the error term are uncorrelated with each other (no serial correlation).
- The error term has a constant variance (no heteroskedasticity).
- No explanatory variable is a perfect linear function of any other explanatory variable (s) (no perfect multicollinearity).
- The error term in normally distributed (this assumption is optional but usually is invoked). (Studenmund, 2001).

The day-of-the-week effect is examined through estimating the following time series regression model which includes five dummy variables, one for each day of the week:

$$R_{mt} = \beta_1 D_{1t} + \beta_2 D_{2t} + \beta_3 D_{3t} + \beta_4 D_{4t} + \beta_5 D_{5t} + \delta AR(1) + e_t$$

R_{mt} is the market return on day t.

D_{jt}: are dummy variables which take on the value 1 if the corresponding day is a Sunday, Monday, Tuesday, Wednesday or Thursday respectively and 0 otherwise. *AR(1)* is added to account for the lagged effect of market return. The model is estimated without an intercept in order to avoid the dummy variable trap (for more information, see Gujarati, 2004).

The month of the year effect is examined through estimating the following time series regression model which includes twelve dummy variables, one for each month of the year:

$$R_{mt} = \beta_1 D_{1t} + \beta_2 D_{2t} + \beta_3 D_{3t} + ... + \beta_{12} D_{12t} + \delta AR(1) + e_t$$

R_{mt} is the market return on month t.

D_{jt}: are dummy variables which take on the value 1 if the corresponding month is January, February, March, …, or December, respectively and 0 otherwise.

Finally, the turn of the month effect is investigated by estimating the following time series regression model:

$$R_{mt} = \alpha + \beta_{1t} D_{1t} + e_{it}$$

R_{mt} is the market return on day t.

D_{jt}: is a dummy variable that takes a value of one if the corresponding day is the last trading day in a month or one of the three trading days in the beginning of the following month.

Two approaches are used to estimate the three models, OLS with Newey-West HAC Standard Errors and Covariance in order to account for heteroskedasticity and serial correlation in the obtained residuals and GARCH (1, 1) as a standard model to control for heteroskedasticity.

The GARCH analysis is an econometric term developed in 1982 by Robert F. Engle, an economist and 2003 winner of the Nobel Memorial Prize for Economics to describe an approach that estimates volatility in financial markets. There are several forms of GARCH modeling. The GARCH process is often preferred by financial modeling professionals because it provides a more real-world context than other forms when trying to predict the prices and rates of financial instruments.

The general process for a GARCH model involves three steps. The first is to estimate a best-fitting autoregressive model; secondly, compute autocorrelations of the error term and lastly, test for significance. GARCH models are used by financial professionals in several areas including trading, investing, hedging and dealing

The methodology for the Sunday effect represented by making the coding system for the days at the Excel program. The program uses function to understand that Sunday takes number 2, Monday takes number 3, Tuesday takes number 4, Wednesday takes number 5, and Thursday takes number 6. After that, we make a dummy variable for each day of the week by using if statement. Finally we use the returns for all days.

The analysis for the January effect is similar to the analysis before by making the coding system for the months at the Excel program. It takes number 1 for January, number 2 for February, …., number 12 for December.

We use an error value of 5% to determine the level of significance. Moreover, a pool estimation of all exchanges is conducted to examine the three effects.

Chapter five

Results and Discussion

5.1 Introduction

5.2 Descriptive Statistics of Daily and Monthly Market Return

5.3 Overview of Indexes of GCC Stock Exchanges

5.4 Analysis of the Day of the Week Effect

5.5 Analysis of the January Effect

5.6 Analysis of the Turn of the Month Effect

5.7 Robustness Check

5.8 Pooled Analysis Overall the GCC Stock Exchanges

Chapter five

Results and Discussion

5.1 Introduction

The aim of this chapter is to examine the existence of the calendar anomalies, which are day of the week effect, January effect, and turn of the month effect in the GCC stock exchanges. As we mentioned before, we use the period from Dec, 31st 2007 to Dec, 31st 2012 for the daily data, and from May, 31st 2002 to Dec, 31st 2012 for the monthly data.

The analysis uses two statistical approaches; the OLS regression and GARCH regression. In addition to some simple statistics.

This chapter reports the results of the calendar anomalies in the GCC stock exchanges, and interprets these results in each of them.

5.2 The Descriptive Statistics of Daily and Monthly Market Return

The descriptive statistics make an overview about the behavior of each exchange, volume of trading, and how each exchange market is affected by the global financial crisis and other factors.

Table (5.1) reports the descriptive statistics of the daily market returns of the GCC stock indexes. From 1305 observations for each market, the daily average returns ranges from -0.0013 for Bahrain to -0.0001 for

Qatar. All mean returns are negative indicating that indexes' prices were decreasing over the study period rather than increasing. All the median values are zero. This is normally expected because of the fact that we investigate the index returns. The maximum daily returns ranges from 0.1800 for Emirates to 0.0621 for Bahrain. The minimum daily returns ranges from -0.1755 to -0.1103 for Oman and Kuwait respectively. Thus, the daily returns show small deviation, between 0.0189 for Emirates and 0.0130 for Bahrain.

Table (5.1): The descriptive statistics of the daily market returns of the GCC stock exchanges over the period (2008-2012)

Status	Bahrain	Emirates	Kuwait	Oman	Qatar	Saudi
Mean	-0.0013	-0.0007	-0.0006	-0.0004	-0.0001	-0.0004
Median	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	0.0621	0.1800	0.0804	0.0957	0.1058	0.0987
Minimum	-0.1431	-0.1478	-0.1103	-0.1755	-0.1344	-0.1519
Std. Dev	0.0130	0.0189	0.0152	0.0146	0.0161	0.0163

Table (5.2) displays the descriptive statistics of the monthly market returns of the GCC stock indexes. From 127 observations, some differences can be noted, while the monthly mean index return is positive in some counties, it is negative in others. The mean ranges from -0.0037 for Bahrain to 0.0098 for Qatar. Medians are also different. They range from 0.0022 for Bahrain to 0.0169 for Saudi Arabia. The maximum monthly returns range from 0.4476 for Qatar to 0.1600 for Oman. The minimum values are negative for all exchanges. They range from -0.2192 to -.03789 for Kuwait and Emirates, respectively. Finally, the standard deviation ranges from 0.0635 for Oman to 0.1110 for Emirates.

As a whole, the Qatari index shows the maximum mean returns over the study period, while Bahraini index shows the minimum value. Moreover the maximum value of monthly index return is largest in Qatari Stock Exchange, while the Emirati index showed the maximum loss during the study period among other GCC stock exchanges.

Table (5.2): The descriptive statistics of the monthly market returns of the GCC stock exchanges over the period (2002-2012)

Status	Bahrain	Emirates	Kuwait	Oman	Qatar	Saudi
Mean	-0.0037	0.0076	0.0031	0.0053	0.0098	0.0069
Median	0.0022	0.0025	0.0114	0.0084	0.0123	0.0169
Maximum	0.1604	0.4143	0.1672	0.1600	0.4476	0.2040
Minimum	-0.2864	-0.3789	-0.2192	-0.3589	-0.3130	-0.3074
Std. Dev	0.0663	0.1110	0.0632	0.0635	0.1016	0.0904

5.3 Overview of Indexes of GCC Stock Exchanges

This section describes the behavior of the market returns of each stock exchange of the GCC stock exchanges. In specific, we figure the index return of each country over the study period.

Figures 1-6 show the monthly index returns of the GCC stock exchanges over the study period.

All indexes show a sharp decline in 2009, this may be explained by the effect of the global financial crises in late 2008. All indexes are highly volatile. All indexes show a significant rise in the recent years after getting rid of the crises. Also, all show high return volatility in index values along the study period.

Figures

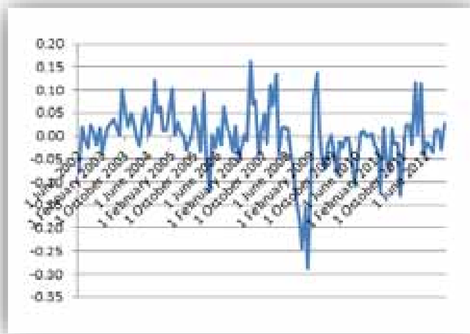


Figure 5.11-Bahraini Index

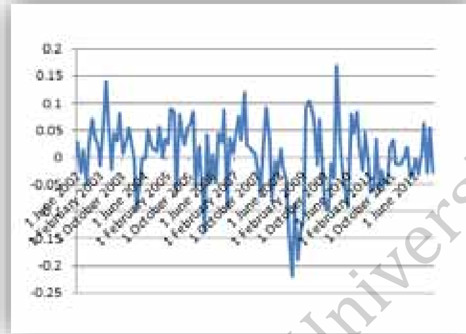


Figure 5.2-Kuwaiti Index



Figure 5.3-Omani Index

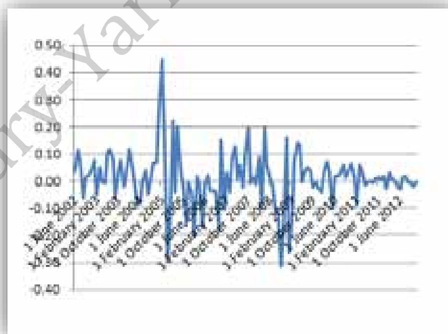


Figure 5.4-Qatari Index

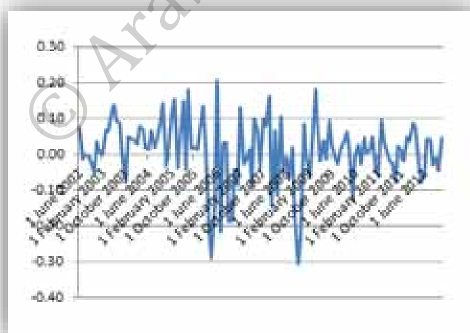


Figure 5.5-Saudi Index

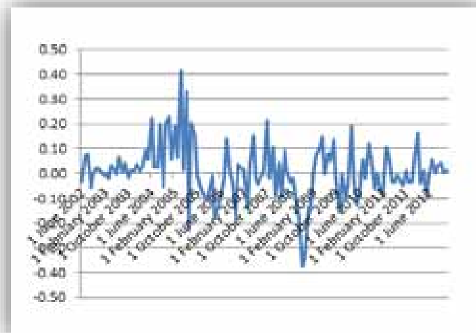


Figure 5.6-Emirati Index

5.4 Analysis of the Day of the Week Effect

In this section, we examine the Day of the Week Effect in the GCC stock exchanges. The GCC stock exchanges start trading from Sunday to Thursday weekly. The idea behind the Day of the Week Effect is that the returns are relatively low in the first day of trading (Sunday) comparing to other days.

Table (5.3) reports the sum and average market returns on a daily basis for the GCC stock exchanges. The results show that there is a significant Sunday effect in each of Bahrain, Kuwait, and Emirates stock exchanges. For these 3 exchanges, the average and the sum of returns are lowest in Sunday (the first trading day in the week). The returns in Thursday equals zero or tend to be zero. The average and the sum of returns are lowest in Monday comparing with the other trading days in the week in each of Qatar, Saudi Arabia, and Oman. These results could indicate a Monday effect in Qatar, and Saudi Arabia, and Oman.

Table (5.3): The average and the sum returns on a daily basis of the GCC stock indexes over the period (2008-2012)

DAY	Bahrain		Kuwait		Oman		Qatar		Saudi		Emirates	
	Avg	Sum	Avg	Sum	Avg	Sum	Avg	Sum	Avg	Sum	Avg	Sum
Sunday	-0.0036*	-0.9343	-0.0040*	-1.0390	0.0000	-0.0118	0.0004	0.1050	0.0000	0.2198	-0.0021*	-0.5599
Monday	-0.0020	-0.5162	0.0005	0.1256	-0.0013*	-0.3460	-0.0008*	-0.2037	-0.0023*	-0.5938	-0.0019	-0.4935
Tuesday	-0.0007	-0.1913	0.0001	0.0356	-0.0009	-0.2383	-0.0002	-0.0482	-0.0003	-0.0876	-0.0003	-0.0734
Wednesday	-0.0001	-0.0282	0.0006	0.1479	0.0003	0.0886	0.0002	0.0439	0.0000	0.0004	0.0006	0.1554
Thursday	0.0000	0.0000	0.0000	-0.0007	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0014	0.0000	-0.0061

Table (5.4) reports the Ordinary Least Square (OLS) regression results for the day of the week effect in GCC stock exchanges. According to Table (5.4), there is a statistically significant Sunday effect in Bahrain with a coefficient of -0.0036, and Kuwait with a coefficient of -0.0040 . The negative sign of the coefficient values mean that the returns are lower than others. The Sunday effect does not exist in the rest of the GCC stock exchanges. The results also show a statistically significant Monday effect in Bahrain and Saudi Arabia with coefficients of -0.0020 and -0.0022 respectively .

This result agrees with (Alrabadi and Qudah, 2012) who finds a statistically significant day of the week effect in the Amman stock exchange (ASE) emerging, (Ulussever et at, 2011), and (Charles, 2007) for the developed markets. However, it clashes with result of (Ullah et at, 2010) who find contrasting results. It also harmonize with (Alexkis and Xanthakis, 1995), (Aggrawal, 1989), and the other studies who find statistically significant day of the week effect.

The analysis reports very low values of the adjusted R-square for all exchanges. It is ranging from 0.0078 for Oman to 0.0245 for Emirates. This may be explained by the use of dummy variables which do not explain the dependent variable.

Table (5.4): The results of OLS regressions for the Day of the Week Effect of the GCC stock exchanges over the period (2008-2012)

DAY	Bahrain		Kuwait		Oman		Qatar		Saudi		Emirates	
	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
Sunday	-0.0036*	0.0053	-0.0040*	0.0132	0.0000	0.9742	0.0004	0.7838	0.0008	0.6487	-0.0021	0.2419
Monday	-0.0020*	0.0213	0.0005	0.5783	-0.0014	0.1146	-0.0008	0.4532	-0.0022*	0.0353	-0.0019	0.0959
Tuesday	-0.0007	0.2654	0.0001	0.8604	-0.0009	0.2671	-0.0002	0.8500	-0.0003	0.6131	-0.0003	0.7929
Wednesday	-0.0001	0.8763	0.0006	0.4566	0.0003	0.6090	0.0002	0.8233	0.0000	0.9255	0.0006	0.4957
Thursday	0.0000	0.9999	0.0000	0.3588	0.0000	0.9990	0.0000	1.0000	0.0000	0.3489	0.0000	0.7677
AR1	0.0649	0.1036	0.0549	0.2881	0.0761	0.1805	0.1146	0.0141	0.0748	0.2042	0.1459	0.0015
Adjusted R-square	0.0149		0.0158		0.0078		0.0137		0.0093		0.0245	

Table (5.4) shows consistent results with those in Table (5.3). The consistency is an evidence of the accuracy in the reported results. Thus, it supports the validity of our results. The first analysis add the returns together, but the regression analysis examines statistically if the returns are lower in Sundays.

Based on these results, we accept hypothesis H_1 "There is a statistically significant the day of the week effect in the GCC stock exchanges" for Bahrain, Kuwait, and Saudi Arabia stock exchanges, and reject it for Emirates, Oman, and Qatar.

5.5 Analysis of the January Effect

Table (5.5) displays the average and sum returns on a monthly basis for the GCC stock exchanges over the study period. The results report that there is no significant January effect in all of the GCC stock exchanges. This effect exists in a lot of the exchanges around the world. One explanation of January effect is that in order to avoid taxes, investors sell their stocks in December and buy them back in January. The excess demand in January increases stock prices. However, GCC countries are tax haven ones thus as emerging markets they do not impose high taxes so that January effect does not exist.

Table (5.5): The average and sum returns on a monthly basis of the GCC stock indexes over the study period (2002-2012)

Month	Bahrain		Kuwait		Oman		Qatar		Saudi		Emirates	
	Avg	Sum	Avg	Sum	Avg	Sum	Avg	Sum	Avg	Sum	Avg	Sum
Jan	-0.0172	-0.1720	0.0005	0.0048	0.0133	0.1328	-0.0129	-0.1289	-0.0043	-0.0428	-0.0362	-0.3616
Feb	0.0036	0.0363	0.0031	0.0314	0.0000	-0.0004	0.0262	0.2618	0.0342	0.3420	0.0220	0.2198
Mar	-0.0082	-0.0819	0.0005	0.0054	0.0057	0.0570	0.0415	0.4152	0.0200	0.2001	0.0152	0.1517
Apr	0.0245	0.2452	0.0323	0.3226	0.0451	0.4507	0.0177	0.1768	0.0087	0.0866	0.0643	0.6428
May	0.0034	0.0345	-0.0061	-0.0606	0.0072	0.0722	-0.0253	-0.2533	-0.0154	-0.1536	-0.0006	-0.0065
Jun	-0.0048	-0.0531	0.0067	0.0733	0.0217	0.2382	0.0233	0.2562	0.0331	0.3639	0.0221	0.2429
Jul	-0.0041	-0.0446	0.0043	0.0473	-0.0076	-0.0838	0.0293	0.3218	-0.0015	-0.0170	0.0019	0.0206
Aug	-0.0020	-0.0216	0.0158	0.1741	-0.0004	-0.0042	0.0265	0.2918	0.0282	0.3100	0.0286	0.3148

Continued: table (5.5)

Sep	-0.0090	-0.0994	0.0110	0.1215	-0.0065	-0.0712	-0.0076	-0.0841	-0.0007	-0.0078	0.0365	0.4020
Oct	0.0015	0.0166	-0.0118	-0.1294	-0.0153	-0.1679	-0.0100	-0.1097	-0.0328	-0.3611	-0.0177	-0.1946
Nov	-0.0298	-0.3282	-0.0095	-0.1048	-0.0004	-0.0040	-0.0319	-0.3505	-0.0234	-0.2576	-0.0562	-0.6178
Dec	0.0002	0.0021	-0.0085	-0.0934	0.0049	0.0535	0.0409	0.4494	0.0379	0.4170	0.0135	0.1484

Table (5.6) reports the OLS regression results of January effect in GCC stock exchanges. There is no statistically significant January effect in all GCC stock exchanges. This results agree with the results of the previous analysis. Adjusted R-square ranges from 0.1057 for Qatar to 0.2698 for Bahrain.

This result harmonize with (Patel, 2012), (Ahsan and Sarker, 2013), and (Rafique and Shah, 2012) in emerging markets who don't find statistically significant January effect. Moreover, it disagrees with the results of (Aggrawal, 1989) in emerging exhanges, (Dahlquist and Sellin, 1994), and (Hepsen and Ali, 2012) in developed market. The result agrees with the studies that find month of the year effect other than January effect which are (Ahsan and Sarker, 2013), and (Dahlquist and Sellin, 1994).

The results indicate a statistically significant December effect in Saudi Arabia with a coefficient of 0.0379, which means that the returns are higher in December than other months of the year. The results also indicate a statistically significant April effect in Oman with a coefficient of 0.0451 . The coefficient of April in Oman indicates higher returns this month comparing to other months of the year.

Table (5.6): The results of OLS regressions for the January effect of the GCC stock exchanges over the period (2002-2012)

Month	Bahrain		Kuwait		Oman		Qatar		Saudi		Emirates	
	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
Jan	-0.0159	0.5985	-0.0003	0.9887	0.0143	0.3356	-0.0139	0.7406	-0.0042	0.8655	-0.0362	0.1350
Feb	0.0043	0.8731	0.0029	0.9023	0.0003	0.9882	0.0260	0.6413	0.0342	0.1116	0.0220	0.4366
Mar	-0.0079	0.7056	0.0004	0.9872	0.0058	0.7752	0.0415	0.0981	0.0200	0.5670	0.0152	0.6371
Apr	0.0247	0.2142	0.0322	0.1107	0.0451*	0.0121	0.0177	0.6812	0.0087	0.8256	0.0643	0.1712
May	0.0035	0.8854	-0.0061	0.7746	0.0072	0.7356	-0.0253	0.4531	-0.0154	0.5602	-0.0006	0.9841
Jun	0.0026	0.8441	0.0046	0.7642	0.0212	0.0577	0.0220	0.4240	0.0292	0.3545	0.0273	0.5281
Jul	-0.0004	0.9773	0.0035	0.8074	-0.0078	0.6114	0.0290	0.0631	-0.0024	0.9305	0.0032	0.9121
Aug	-0.0002	0.9919	0.0155	0.1490	-0.0004	0.9790	0.0265	0.2800	0.0280	0.1763	0.0290	0.2944
Sep	-0.0082	0.6926	0.0109	0.5814	-0.0065	0.7432	-0.0077	0.6823	-0.0008	0.9719	0.0366	0.2656

Continued: table (5.6)

Oct	0.0019	0.9221	-0.0118	0.6328	-0.0153	0.6696	-0.0100	0.7785	-0.0328	0.3626	-0.0177	0.6742
Nov	-0.0296	0.1769	-0.0095	0.6538	-0.0004	0.9824	-0.0319	0.2703	-0.0234	0.4628	-0.0562	0.1654
Dec	0.0003	0.9873	-0.0085	0.6838	0.0049	0.7534	0.0409	0.0502	0.0379*	0.0386	0.0135	0.6229
AR1	0.4900	0.0005	0.3727	0.0023	0.3513	0.0006	0.2227	0.0628	0.2288	0.0706	0.2621	0.1294
Adjusted R-square	0.2698		0.1691		0.1715		0.1057		0.1124		0.1439	

Based on these results, we reject H_2 "There is a statistically significant January effect in the GCC stock exchanges" for all GCC stock exchanges.

5.6 Analysis of the Turn of the Month Effect

The Turn of the Month Effect is a widespread phenomenon in the exchanges around the word. According to this effect, most returns are achieved in the last day of the month and the following two days from the following one. It is an expected phenomenon, because investors and employees receive their salaries at the end of each month.

Table (5.7) reports the OLS regression results of the TOM effect in the GCC stock exchanges. The results show no statistically significant turn of the month effect for all GCC stock exchanges. The reason of this result may be that investors in the GCC stock exchanges are senior investors. They do not need to wait the salary in order to trade.

The adjusted R-square ranges from 0.0028 for Kuwait to 0.0218 for Emirates.

This result disagrees with the results of (McGuiness, 2006), and (Alrabadi and Qudah,2012) studies.

Based on these results, we reject hypothesis H_3 "There is a statistically significant turn of the month effect in the GCC stock exchanges" for all GCC stock exchanges.

Table (5.7): The results of OLS regressions for the Turn of the Month Effect of the GCC stock exchanges over the period (2008-2012)

variable	Bahrain		Kuwait		Oman		Qatar		Saudi		Emirates	
	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
C	-0.0013	0.0022	-0.0005	0.3005	-0.0005	0.3012	-0.0002	0.6679	-0.0004	0.4872	-0.0009	0.1577
TOM	0.0005	0.5747	-0.0005	0.6810	0.0007	0.4551	0.0014	0.2663	0.0003	0.7921	0.0012	0.4882
AR1	0.0643	0.0973	0.0513	0.3245	0.0750	0.1856	0.1132	0.0145	0.0728	0.2118	0.1452	0.0016
Adjusted R-square	0.0044		0.0028		0.0060		0.0137		0.0054		0.0218	

The final result that should be mentioned is that GCC stock exchanges are inefficient at the week level given that some calendar anomalies are found to be significant. This result harmonize with (Harper and Jin, 2001), (Ngugen et at, 2012), (Barone, 1989), and the studies which find anomalies in the stock exchange.

The existence of such anomalies indicates that stock prices are predictable, not randomly moving and thus investors can formulate their investment strategy and achieve abnormal returns accordingly.

5.7 Robustness Check

In this section we repeat the whole regression analysis using GARCH as an estimation approach. We use GARCH in order to control for the volatility effect of stock returns on our results.

Table (5.8) presents the results of GARCH regression for the day of the week effect. The results show statistically significant Sunday effect in Bahrain. The coefficient equals -0.004, which means that returns are relatively low in Sunday comparing to other days.

The results are similar to a large extent with the OLS regression analysis. Table (5.8) also reports statistically significant Thursday effect in Kuwait with a coefficient of -0.0001, Bahrain with a coefficient of 0.0002, and Oman with a coefficient of 0.0002. The positive sign of the

coefficients in Bahrain and Oman indicates that the Thursdays' returns are higher than other days.

Table (5.8): The results of GARCH regressions for the Day of the Week Effect of the GCC stock exchanges over the period (2008-2012)

DAY	Bahrain		Kuwait		Oman		Qatar		Saudi		Emirates	
	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
Sunday	-0.0040*	0.0000	-0.0014	0.1209	0.0007	0.3677	0.0004	0.5690	0.0021	0.0724	-0.0020	0.1157
Monday	-0.0009	0.1072	0.0006	0.2884	-0.0003	0.5835	-0.0001	0.7778	-0.0008	0.2289	-0.0003	0.6682
Tuesday	-0.0013	0.0421	-0.0002	0.7350	0.0009	0.0954	0.0005	0.3483	0.0009	0.1582	0.0008	0.2384
Wednesday	0.0001	0.8670	0.0003	0.6585	0.0009	0.0843	0.0005	0.3233	0.0001	0.0378	0.0020	0.0120
Thursday	0.0002*	0.0000	-0.0001*	0.0339	0.0001*	0.0005	0.0000	0.5138	0.0000	0.0446	0.0001	0.5110
AR1	0.0126	0.7164	0.0348	0.2507	0.0306	0.5443	0.1355	0.0001	0.0431	0.2472	0.0936	0.0052
Adjusted R-square	0.0102		0.0094		0.0010		0.0126		0.0049		0.0190	

Table (5.9) reports the results of the GARCH regressions of the January effect in GCC stock exchanges. Table (5.9) shows that there is a statistically significant January effect in Oman with a 0.0460 coefficient. It also reports a statistically significant February effect in Emirates with a coefficient of 0.0294 , March effect in Saudi Arabia with a coefficient of 0.0497 , April effect in Oman with a coefficient of 0.0444 , May effect in Qatar with a coefficient of -0.0339 , July effect in Qatar with a coefficient of 0.0265 , August effect in Qatar with a coefficient of 0.0243, September effect in Emirates with a coefficient of 0.025 , and December effect in Saudi Arabia with a coefficient of 0.0326 . All the effects that mentioned before show positive coefficients which indicates higher returns in that month comparing to other months of the year, except May effect in Qatar.

The value of adjusted R-square ranging from 0.0533 for Emirates to 0.2053 for Bahrain.

Table (5.9): The results of GARCH regressions for the January Effect of the GCC stock exchanges over the period (2002-2012)

Month	Bahrain		Kuwait		Oman		Qatar		Saudi		Emirates	
	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
Jan	0.0092	0.6168	0.0095	0.4202	0.0460*	0.0023	-0.0086	0.5830	-0.0032	0.8582	0.0035	0.8419
Feb	0.0148	0.4859	0.0068	0.6885	-0.0091	0.5908	0.0061	0.6704	0.0259	0.1217	0.0294*	0.0499
Mar	-0.0149	0.2479	-0.0048	0.8458	0.0195	0.2280	0.0242	0.0692	0.0497*	0.0087	-0.0110	0.5712
Apr	0.0325	0.1346	0.0254	0.1947	0.0444*	0.0184	0.0130	0.1651	0.0134	0.5882	0.0263	0.2136
May	0.0166	0.4046	-0.0096	0.6128	0.0023	0.9055	-0.0339*	0.0076	-0.0212	0.4342	-0.0201	0.3416
Jun	0.0090	0.3411	0.0015	0.9168	0.0218	0.0746	-0.0101	0.3668	0.0012	0.9477	0.0093	0.5957
Jul	-0.0034	0.7298	0.0044	0.7489	-0.0037	0.7616	0.0265*	0.0001	0.0032	0.8348	0.0565	0.0000
Aug	0.0144	0.3464	0.0141	0.1747	0.0057	0.6579	0.0243*	0.0001	-0.0024	0.8717	0.0141	0.2205

Continued: table (5.9)

Sep	0.0046	0.7944	0.0184	0.2782	0.0138	0.3509	0.0072	0.2645	0.0043	0.7702	0.0250*	0.0379
Oct	0.0182	0.0983	0.0007	0.9655	0.0150	0.1726	-0.0014	0.7605	-0.0126	0.4759	0.0166	0.3179
Nov	-0.0098	0.2519	0.0053	0.7733	-0.0046	0.7131	-0.0181	0.0000	-0.0174	0.2288	-0.0082	0.4599
Dec	0.0223	0.1272	0.0015	0.9253	0.0066	0.5442	-0.0044	0.0000	0.0326*	0.0018	0.0106	0.1316
AR1	0.3079	0.0000	0.2985	0.0015	0.3182	0.0001	0.1204	0.2601	0.2597	0.0081	0.1327	0.1118
Adjusted R-square	0.2053		0.1542		0.1127		0.0598		0.0745		0.0533	

Table (5.10) presents the results of GARCH regression for the turn of the month effect. The results report a statistically significant turn of the month effect in Qatar with a positive coefficient of 0.0016. It also shows a declining value of the adjusted R-square that ranging between 0.0014 for Kuwait and 0.0173 for Emirates.

Table (5.10): The results of GARCH regressions for the Turn of the Month Effect of the GCC stock exchanges over the period (2008-2012)

Variable	Bahrain		Kuwait		Oman		Qatar		Saudi		Emirates	
	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
C	-0.0007	0.0008	-0.0001	0.7850	0.0005	0.0524	0.0000	0.9886	0.0004	0.1310	-0.0002	0.6711
TOM	-0.0007	0.3771	-0.0007	0.4675	-0.0003	0.6622	0.0016*	0.0076	0.0006	0.6087	0.0012	0.4277
AR1	0.0436	0.1786	0.0261	0.3982	0.0445	0.3940	0.1079	0.0016	0.0385	0.2768	0.0883	0.0118
Adjusted R-square	0.0019		0.0014		0.0016		0.0134		0.0018		0.0173	

5.8 Pooled Analysis Overall the GCC Stock Exchanges

In this section, we conduct a pool regression estimation to all GCC stock exchanges in order to inspect calendar effects overall the general 6 exchanges.

Table (5.11) reports the pooled regression results of the day of the week effect in GCC stock exchanges. The results indicate a statistically significant Sunday effect over all the GCC stock exchanges. The negative coefficient indicates the lower returns in Sunday. It equals -0.0014 . The results are close enough to the OLS regression results of the Sunday effect. A statistically significant Monday effect is found over the GCC stock exchanges with coefficient of -0.0013 indicates the low returns in Monday. The adjusted R-square equals 0.0107 . We notice that the adjusted R-square still takes low values given the use of dummy variables.

Table (5.11): The results of the pooled regression of the day of the week effect in all GCC stock exchanges over the period (2008-2012)

Day	Coefficient	Probability
Sunday	-0.0014*	0.0004
Monday	-0.0013*	0.0012
Tuesday	-0.0004	0.3344
Wednesday	0.0003	0.5134
Thursday	0.0000	0.9815
AR1	0.0941	0.0000
Adjusted R-square	0.0107	

Table (5.12) reports the pooled regression results of January effect in GCC stock exchanges. The results report no statistically significant January Effect over all the GCC stock exchanges. They are similar to those of OLS regression. Table (5.12) shows a statistically significant April effect with a coefficient 0.0321 which indicates higher returns comparing to other months of the year, and November effect over the GCC stock exchanges with negative coefficient value -0.0252 that indicates lower returns in this month. The dummy variable still causes the declining value of adjusted R-square which is 0.1101 .

Table (5.12): The results of the pooled regression of the January Effect in all GCC stock exchanges over the period (2002-2012)

Month	Coefficient	Probability
Jan	-0.0095	0.3804
Feb	0.0148	0.1723
Mar	0.0125	0.2520
Apr	0.0321*	0.0033
May	-0.0061	0.5732
Jun	0.0178	0.1015
Jul	0.0039	0.7052
Aug	0.0162	0.1185
Sep	0.0040	0.7014
Oct	-0.0143	0.1670
Nov	-0.0252*	0.0153
Dec	0.0148	0.1535
AR1	0.2812	0.0000
Adjusted R-square	0.1101	

Chapter Six

Summary and Conclusion

6.1 Summary and Results

6.2 Recommendations

Chapter Six

Summary and Conclusion

6.1 Summary and Results

Fama (1970) introduces the efficient market hypothesis. The hypothesis can be summarized in three major forms. The week form, the semi-strong form, and the strong form. This hypothesis states that prices reflect all information that reached to the market quickly, directly, and accurately. According to this hypothesis, no investor can achieve abnormal returns by selling and purchasing any form of investments. After few years, the hypothesis faced many challenges. One of these challenges is called seasonality or calendar anomalies. We focus on three of them. The first, is the Sunday Effect (the Day of the Week Effect). It indicates that returns tend to be lowest (highest) in a specific day of the week. The second, is the January Effect (Month of the Year Effect). It means that the returns are higher in January than other months of the year. The third, is the Turn of the Month Effect. This effect indicates that most returns are achieved in the turning days of the calendar.

The main objective of this study is to investigate the presence of the calendar anomalies in the GCC stock exchanges. The OLS regressions and the GARCH regressions are used. The data represents the daily and

monthly market indexes over the period from Dec, 31 2007 to Dec, 31 2012 for the daily data, and from May, 31 2002 to Dec, 31 2012 for the monthly data.

After the study investigates the calendar anomalies in the GCC stock exchanges, we conclude these main results:

1- The study finds a statistically significant Sunday Effect (Day of the Week Effect) in each of Bahraini and Kuwaiti stock exchanges.
2- No statistically significant January Effect (Month of the Year Effect) is found in any exchange of the GCC stock exchanges.
3- No statistically significant Turn of the Month Effect is found in any exchange of the GCC stock exchanges.
4- The study finds a statistically significant Monday Effect in Bahrain and Saudi Arabia.
5- The study finds a statistically significant April Effect in Oman and December in Saudi Arabia.
6- GCC stock exchanges are inefficient at the weak level.
7- The results of the day of the week effect are robust to the estimation method. However, the results of the month of the year and turn of the month effects are sensitive to the models used.

6.2 Recommendations

Based on the results of the research, the researcher recommends the following:

1- We recommend Bahraini and Kuwaiti investors to buy stocks in Sunday given its lower prices compared to other days of the week.
2- We recommend Bahraini and Saudi investors to buy stocks in Monday given its lower prices compared to other days of the week.
3- We recommend Omani investors to sell stocks in April and Saudi investors to sell stocks in December, given its higher prices compared to other months.
4- We recommend investors to persist in technical analysis in order to predict stock prices given that GCC stock exchanges are inefficient at the week level.
5- We recommend future researches to focus on other price anomalies such as momentum and reversals in GCC stock exchanges.

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الملخص

تقوم هذه الدراسة على اختبار وجود إنحرافات التقويم في أسواق الأسهم في دول مجلس التعاون الخليجي على الفترة (2002-2012). وبالتحديد فإن الدراسة تركز على فحص أثر أيام الاسبوع، أثر أشهر السنة، وأثر انقلاب الشهر في هذه الأسواق. ولتحقيق هذه الاهداف، العديد من الاساليب الاحصائية تم استخدامها لاختبار النماذج التجريبية لدراسة المتغيرات الوهمية. نتائج تحليل (OLS) واختبار (GARCH) أظهرت وجود أثر ايام الاسبوع (أثر يوم الأثنين) في سوقي البحرين والكويت، مع عدم وجود أثر يوم الأثنين في الاسواق الأخرى. علاوة على ذلك، فقد بينت الدراسة عدم وجود دلالة احصائية لشهر كانون الثاني أو لإنقلاب الشهر في اي من الأسواق الخليجية. بناء على هذه النتائج، توصي الدراسة المستثمرين البحرينيين والكويتيين لشراء اسهمهم يوم الأثنين.